

Innovations in Service: Probing the Evidence in Sustainable Tourism

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Abstract. *Innovation is a critical key to sustainable tourism, as it plays a big part in shaping products and services to be provided in the tourism industry. The competition in sustainable tourism is high due to the discourse to bring positive externalities and the presence of the rent-seeking. This study aims to investigate the innovation process in sustainable tourism by employing a combination of the bibliometric analysis from and systematic review on 91 scientific publications on Web of Science (WoS). A contemporary view of innovation economics is used to approach the analysis. Our research reveals that innovations in most scientific literature are non-radical. Changing the business model is also essential for tourism firms to be more sustainable in the practices. There is a global trend to implement technological innovations in Information and Communication Technologies (ICTs) to pursue the sustainability concept in tourism. Also, our literature review reveals that tourism firms utilise resource-efficient technologies to help to resolve the issues of climate change. Some limitations in investigating the implementation of innovation in sustainable tourism are also discussed. Finally, this study suggests theoretical contributions as well as methodological recommendations for future research.*

Keywords: *Innovation, sustainable tourism, bibliometric study, systematic review*

1. Introduction

The tourism industry has become one of the largest sectors that generate massive economic benefits. However, it is argued that the tourism sector has also shifted its focus from economic development to sustainability implications (Budeanu et al., 2015). The increasing number of research and reports indicates the significant role of sustainable tourism as part of governmental and practical programmes to implement environmental management systems (Budeanu et al., 2015).

Given its prominent role in tourism sustainability, Kuscer, et al. (2017) suggest that tourism development is determined by natural, socio-cultural and economical as the sustainability criteria. For example, mountain destinations are measured through their natural environment preservations, socio-

economic welfare and economic performances (Kuscer et al., 2017).

Apart from that, a number of studies (e.g. Cucculelli & Goffi, 2016; Kiralova, 2019) confirm that sustainable tourism can bring competitive advantage to a destination. Accordingly, innovation is crucial to maintain and improve sustainable tourism. However, the mechanism of innovations in the service sector is still poorly understood. Most studies explore the scientific understanding of innovations on technology or manufacturing industry (e.g. Chester Goduscheit & Faillant, 2018; Jimenez-Jimenez, Martínez-Costa & Sanchez Rodriguez, 2019). Tourism industry is traditionally classified as a service industry. Nevertheless, tangible products have an undeniably important role in shaping service industry. The complex interaction between product and service in the tourism industry

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gives a different articulation in understanding innovations. In this paper, the notion of services includes products that are bundled with services (Chester Goduscheit & Faillant, 2018). The urgency to understand innovations in sustainable tourism appears because economic interventions are deemed important to make the business sustainable and competitive given the ever changing economic, environmental and socio-cultural challenges (Del Chiappa, Usai, Cocco, & Atzeni, 2018). Tourism firms should show perceptions and attitudes towards innovations in order to be able to sustain and compete in the long run – even though it is a simple innovation free-riding and safe adopting as what tourism SMEs have been doing (Hjalager, 2010).

This study attempts to understand the innovation process in sustainable tourism using economic perspective, rather than politics nor socio-cultural, based on the existing scientific literatures. An empirical study has identified that market competition and firm size are among the institutional determinants of innovation in tourism (Divisekera & Nguyen, 2018). Likewise, higher competitive advantages to the firms (Cucculelli & Goffi, 2016; Kiralova, 2019) and broader positive externalities to society (Budeanu et al., 2015; Kuscer, et al., 2017; Romao & Neuts, 2017; Zolfani et al., 2015) motives the firm benefiting innovations to run their sustainable tourism business.

A combination of bibliometric and systematic review is used answering our research objective. The collection of scientific papers from the Web of Science (WoS) related to innovations in sustainable tourism worldwide is used as the basis for the analysis. We collected ninety-one (91) scientific papers published from 1997 to 2019. Network analysis is performed to understand the recent trends on innovation landscape for sustainable tourism based on the scientific research terms. It provides a high-level view of the existing global research clusters. Later, a systematic review is conducted to probe the practical evidence of innovations in

sustainable tourism and its implication in managerial sphere.

2. Literature study / Hypotheses Development

Sustainable Tourism

Sustainable tourism has become a major subject in the tourism industry for its aim to reduce the negative impact of travel and tourism activities (Sharpley, 2003). Apart from protecting the environment, the purpose of sustainable tourism is to optimise economic benefits, improving living standards of the residents, establishing high-quality tourism experience and maintaining social justice in both developed and developing nations (Budeanu et al., 2015; Zolfani et al., 2015).

The broad scope of sustainable tourism has brought numerous debates and discourses in tourism literature. Weaver (2014), for example, suggests that sustainable tourism is similar to eco-tourism. Meanwhile, Ruhanen et al. (2015) argue that sustainable tourism emerges in coexistence with its parent concept, sustainable development. A more recent study by Mihalic (2016), on the other hand, indicates that sustainable tourism addresses the environmental, economic, and responsibility of tourism as well as its responsibility towards tourists' satisfaction; which leads to 'responsustainable' tourism, a term that demonstrates both responsibility and sustainability in tourism behaviour.

Despite the academic debates on tourism sustainability, scholars (e.g. Kuscer, et al., 2017; Romao & Neuts, 2017) affirm that natural and cultural features, as well as innovations in socio-economic sector, play a prominent role in sustainable tourism. Natural and cultural, as tangible features on tourism contribute a big part in destination development along with the intangible feature of socio-economic innovations; by changing values, utilising renewable energy products, reducing source and waste production (Kuscer et al., 2017). Besides, the innovations of information and communication

technologies with the integration of product knowledge compromise smart tourism experiences (Romao & Neuts, 2017).

Innovations in service

The innovation process has been long regarded to play an essential role in the growth of the modern economy. The share of services as the value-added for the GDP has grown more substantial in the last decade than the industries. The world observes the increasing share of world's services from 61.54 % in 1997 to 65.04 % in 2017 and the declining share of world's industries from 29.62 % in 1997 to 25.39 % in 2016 (World Bank, 2019). Most economic research inspired by Joseph Schumpeter, who laid the first foundation to understand the innovation process, often lean towards technology or manufacturing industry.

The dichotomy of goods and services is apparent in most technological innovation discussions, and they argue that both products and services can provide services. It thus influences the way of technological innovations in services is defined and implemented. Mention (2011) finds that service firms tend to use the knowledge spillovers from competitors to pursue an imitation strategy rather than to induce more far-reaching innovations. The recent digital innovations have dramatically changed the landscape of business model, technological advancement, the interaction with the stakeholders, and diffusion of innovation (Burret et al, 2017; Das, Verburg, Vebraeck & Bonebakker, 2018; Gomber, Kaufman, Parker & Weber, 2018; Samuelsson, Witell, Gottfridsson & Elg, 2019). Burret et al. (2017) use the Service-Dominant (S-D) logic to conceptualise the fundamentals of innovation in services in the digitalised era. They further suggest that Information and Communication Technologies (ICTs) algorithms, likewise knowledge, act as an operant to increase the resource density of knowledge and generate innovations in service. Das, Verburg, Vebraeck & Bonebakker (2018) find that non-traditional

barriers such as restricted mindset, non-invented here syndrome, or lack of fundamental internal R&D avert the services firms to innovate. On the other hand, technological innovation in financial services leverages the value for the stakeholders in related with payments, cryptocurrencies, blockchain, and cross-border payments (Gomber, Kaufman, Parker & Weber, 2018). Thus, in general, the simultaneous implementation of technological and non-technological innovations in services can increase the firm's productivity (González-Blanco, Coca-Pérez & Guisado-González, 2018).

Despite the recent scholarly journey to interpret the complex nature of innovation in services, contemporary view of innovations can still be used to understand the type of innovation in services (Rowley, Baregheh & Sambrook 2011; Samuelsson, Witell, Gottfridsson & Elg, 2019). From the perspective of the degree of novelty of innovation, Rowley, Baregheh & Sambrook (2011) and Samuelsson, Witell, Gottfridsson, & Elg (2019) use a binary classification: radical innovation and non-radical innovation. Non-radical innovation includes improvement innovation, incremental innovation, ad-hoc innovation, recombinative innovation, and formalisation innovation. While Samuelsson, Witell, Gottfridsson, & Elg (2019) categorise incremental innovation as the complement of radical innovation. Bessant and Tidd (2007), from the perspective of the change that comes with innovation, propose four categories of innovation. They are, namely, process innovation, production innovation, position innovation, and paradigm innovation.

The principle of absolute novelty drives radical innovations, thus creates a new product or service. For example, Europe Assistance, an insurance firm, that launched a bundle of care and assistance products as a radical innovation. Non-radical innovation involves improvement and well as the addition of new or secondary characteristics.

Improvement innovation generates improved characteristics, while incremental innovation generates new or secondary characteristics — for example, the additional specifications in the insurance contract to introduce new legal changes as incremental innovation. Ad-hoc innovation refers to a high level of innovative problem-solving interaction between providers and clients in response to particular challenges. This type of innovation usually occurs in the consultancy (informational) services (De Bandt, 1995). Recombinative innovation involves a combination of different current characteristics or division of existing characteristics (Bressand & Nicolaïdis, 1988). Myhren et al. (2018) in their study on open innovation ecosystem, suggest that all innovations in services are recombinative with the degree that can be either radical or incremental. Last but not least, formalisation innovation refers to the standardisation of the various characteristics

to make them replicable for industrial use. The standardisation of ATMs for the transaction over the counter (OTC) is a well-known example of formalisation innovation.

In the proposed framework of Bessant and Tidd (2007), process innovation refers to how service is created and delivered. When firms offer changes in the products, it is regarded as product innovation. Position innovation is stimulated when firms explore the ideas to enter the markets and attract new customers. Paradigm innovation occurs when there is a change in the business model so that firms need to reframe the way of looking at the offered products or services. One of the examples of paradigm innovation in service is the low-cost carrier where the business model focuses on segmented customers who do not want to pay the add-ons inflight services (Tidd et al., 2005).

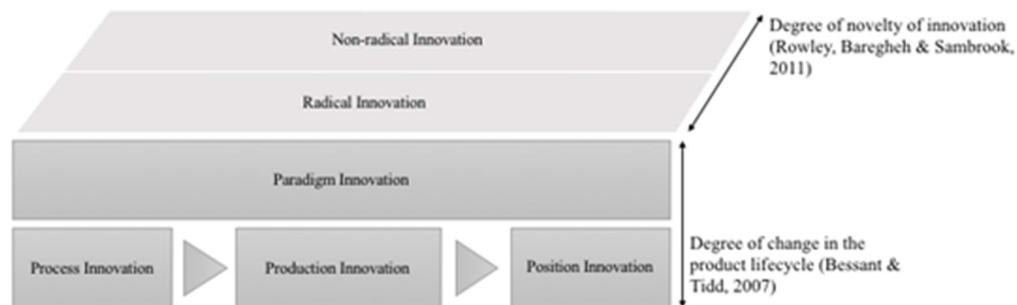


Figure 1.

A Two-Dimensional Model of Innovation Based on Bessant & Tidd (2007) and Rowley, Baregheh & Sambrook (2011)

The dimension of change in the product life cycle can understand which firm attributes that mostly adopt innovations. Here, we argue that sustainable tourism firms mostly innovate the way they attract new customers to be able to pay the costs associated with the rents and externalities. The positive externalities include the spillovers to the local societies. Specific research in Ha Long Bay Vietnam suggests, however, the enormous new capital-intensive tourism development shows an absence of inclusive growth for the local communities (Hampton, Jeyacheya & Long, 2018). Other previous studies, for example, conducted by

Gomezelj (2016) and Hjalager (2010), do not include the notion of sustainability into their research themes on innovations in service for tourism. To the best of our knowledge, there have been no public scientific papers examined innovations in service for sustainable tourism.

Bibliometric study

Scholars have widely used the bibliometric study to probe the past and present state of research interests for various purposes. This method can extract how discipline, fields, specialities, and individual research

components (i.e. scientific publication, author, institution, etc) is conceptually, intellectually, and socially constructed (Cobo, López-Herrera, Herrera-Viedma & Herrera, 2011). The input of bibliometric study is a collection of scientific papers from a particular well-known worldwide scientific literature database. OECD countries, for example, use the output from a bibliometric study to design their policy frameworks for bio-energy developments (Thomas, 1992). The study has also been used to quantitatively measure the development of science, including those related to research management (Mingers & Leydesdorff, 2015).

We choose only scientific papers from either top or low impact journals. We suggest further investigation on high impact journals for future study.

3. Methodology

In this study, we develop three research steps to achieve the research objectives.

First, this study uses bibliometric data to probe the research construction of innovations in sustainable tourism. Among other descriptive research methods, for example literature review, this method can cover a large number of data from the database and process it with analytical software. The search query for this study is “innovation” and “sustainable tourism”. Web of Science (WoS) is used due to its oldest and high-quality collection of scientific publications (Boyle & Sherman, 2006; Chadegani et al., 2013). The year of publication is not limited. We, however, find that the first publication about innovations in sustainable tourism dated back in 1997. This study collects ninety-one (91) scientific publications related to innovations in sustainable tourism. This study uses an open-source software labelled as VOSviewer to analyse the data and visualise the networks (van Eck & Waltman, 2010). VOSviewer, among other bibliometric software i.e. SciMat

or CiteSpace classifies the most occurring terms (research themes) using the association strength based on the bibliometric network (Cobo, López-Herrera, Herrera-Viedma & Herrera, 2011). When two terms are associated and connected, it means that both terms are discussed in the same context. For example, Fig. 2 shows that environmental management is frequently discussed with sustainable development, but it is rarely connected with the discussion of business competitiveness.

The more the cluster is in the observation, the more diverse the research themes are. The clusters visualised in different colours. The interpretation result of the research clusters depends on the spectrum of the scholarship (e.g. Leydesdorff, Carley, & Rafols, 2013; Repanovici & Nedelcu, 2018). VOSViewer provides excellent graphical visualisation in compared to other bibliometric software. It lacks the capability for pre-processing or establishing the relation between parameters (Cobo, López-Herrera, Herrera-Viedma & Herrera, 2011). However, this study does not utilise such feature to construct the conclusions. Besides abstract and the names of the author, the data also contains other information such as citation, research funding, publishing journals, and the country of the author's origin. We use the critical terms from the keywords, title, or abstract for this study. We employ the journal taxonomy (i.e. technology, life sciences & biomedicine, physical sciences, and art & humanities) to identify the spread of research theme. Innovation can be implemented in a broad spectrum of business practices from technological advancement into business model alteration.

Second, this study performs a rigorous literature review of the collected dataset. The study employs this method because the information resulted from bibliometrics study cannot reveal the evidence of innovation in sustainable tourism. The data from the collected WoS' scientific publications will be tabled to the two-dimensional model of

innovation to gather evidence of innovation in sustainable tourism. This table summarises practical evidence on innovations in sustainable tourism.

Third, discussions and conclusions are made based on the results of the bibliometric study and rigorous literature review including the answers to the arguments that we developed earlier in the section of literature review. We present evidence of the innovations in sustainable tourism. Managerial implications are also addressed in a way to present solutions toward the current challenges implementing innovation in sustainable tourism.

Data

The collected scientific publication included in this study retrieve from the Social Science Citation Index (SSCI) and the Emerging Sources Citation Index (ESCI) of WoS. These collections are used because they include thematic researches in the area of innovation services, sustainable tourism, and any overarching discipline related to research interest. Articles from proceeding conference is not included.

4. Finding and Discussion

This section contains four main findings of this study based on the result of bibliometric study and rigorous literature review. The first finding presents the current trends of research theme for innovation in sustainable tourism. The second finding identifies the distribution of research themes concerning innovation development. The third finding identifies and classifies the evidence of innovations in sustainable tourism based on the aforementioned model. Also, the fourth finding clarifies the challenges and managerial implications on the implementation of innovation in sustainable tourism.

Conceptual studies and practices of innovations

Our analysis reveals that there are four research clusters on innovations in sustainable tourism worldwide, as shown by the network

analysis map in Fig. 2. However, it seems that there are two distinctive significant research clusters, namely the theoretical understanding to implement innovations in the tourism industry (in red and green colour) and the practice of innovations in sustainable tourism including the impacts to the wider-scale of shareholders (in blue and yellow colour). The research clusters discussing the theoretical understanding include the scientific terms, e.g. theory, industry, tourism, quality, and experiences. On the other side, the research clusters debating the practice of innovative and sustainable tourism include the scientific terms, e.g. management, environmental management, sustainable tourism development, entrepreneurship, and tourism destination. It is worth to be noted that there is always a possibility the overlapping research clusters as such that the scientific term, for example, sustainable tourism, can be discussed both in theoretical and practical sphere.

Dabphet, Scott, & Ruhanen (2012) discuss how the diffusion theory can be used to understand the development of sustainable tourism in the tourism destination of Kret Island, Thailand. Their study is considered in the shading area, both for the theoretical understanding and practical implementation, by utilising a theoretical framework in a case study. Gavrilovic & Maksimovic (2018) examine the practical implications of ICT's advancement in sustainable tourism to protect the environment and preserve the heritage and natural assets. It is, however, difficult to investigate how innovation is implemented in the sustainable tourism concept based on the network analysis map because of the limited occurrence of innovation-related terms, e.g. radical, non-radical, process, production, position, or paradigm. This study, however, classifies the implementation of innovation based on the two-dimensional model of innovation (refer to Fig. 1) as shown in Table 1.

Our literature review reveals that there are twelve (12) empirical studies on how innovation parameters are engaged in

sustainable tourism. Escobar, Quishpe, & Escobar (2017), for example, argue that the so-called eco-innovation can minimise the harmful effects of tourism on the environment, e.g. the alteration of biologically

productive lands or detrimental consequences for biodiversity. Martina, Buffa & Notaro (2017) find that the value of co-creation and social innovation can be fostered using the role of the Networks of Reserves (NoRs).

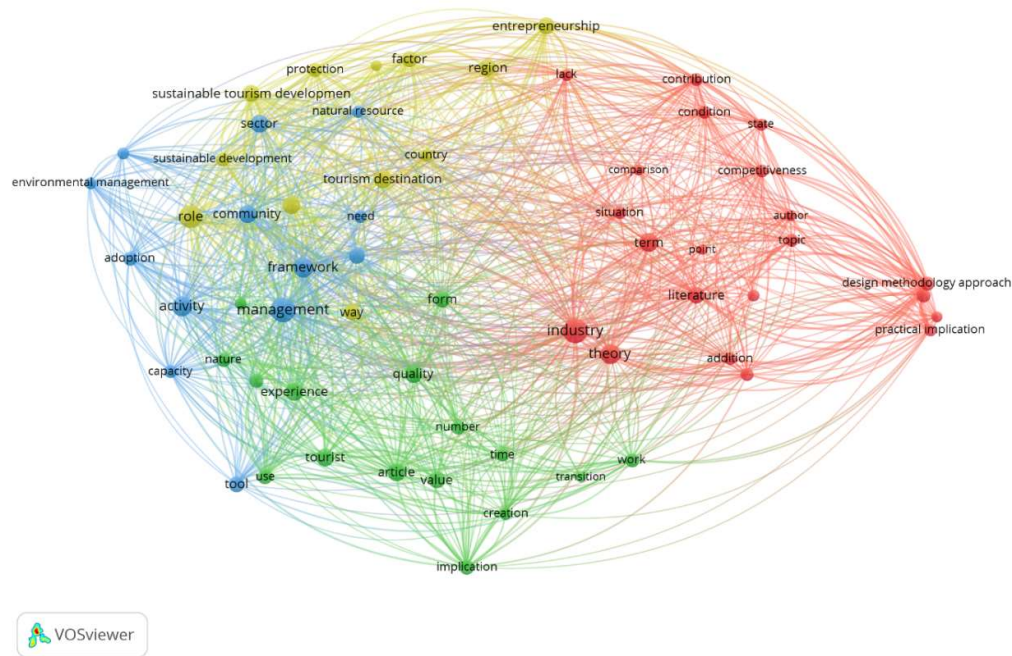


Figure 2.
Network Analysis Map for Worldwide Scientific Topics on Innovations in Sustainable Tourism.

Domination of basic sciences in the research topics

In term of science taxonomy as seen in Fig. 3, this study found that most scientific publications were categorized as social sciences (56%), followed by technology (25%) and life sciences & biomedicine (16%). Physical sciences and Art & humanities contribute to 2% and 1% of scientific publications. It implies that basic science research, namely social sciences, life sciences & biomedicine, and art & humanities dominates the share of scientific publications summing up to 73% of scientific publications. On the other side, applied science research, namely technology and physical sciences, contributes to the rest of the scientific publications (27%). Most researchers were interested in the exploration of basic

understanding. Diffusion theory (Dabphet, Scott, & Ruhanen, 2012), production innovation theory & prospect theory (Peeters, 2013), stakeholder theory (Matilainen, Suutari, Lahdesmaki & Koski, 2018), collaboration theory (Gazzola, Pavione, Grechi & Ossola, 2018), and enlightened stakeholder theory (Knowles, 2019) are among the theories used by scholars. Those theories belong to other disciplines implying that the topic is interdisciplinary and requires broad understanding to reveal the emerging importance of innovations in sustainable tourism. For example, diffusion theory is mainly used in innovation, business, and marketing (Mahajan, 2010) while stakeholder theory is mainly used to explain the concept of partnership and business management

(Freeman, 2010). The gap between basic science research and applied science research can be addressed by understanding the concept of knowledge transfer (Cooper, Ruhanen & Scott, 2015). They argue that knowledge-based innovation can lead tourism organisations and destinations to reinvent their business models.

The share of scientific publications in the social sciences is relevant to the scientific terms found in the network analysis. Socio-economics scientific terms such as competitiveness, entrepreneurship, value,

transition, community, or sustainable development dominated the scientific productions on innovations in sustainable tourism. Among the socio-economics studies for sustainable tourism are the study of the idea generation topic in the hospitality industry (Richard et al., 2018), the model of market orientation for developing sustainable tourism in archeological sites (Lopez, Virto, Manzano & Garcia-Madariaga, 2018), and the relationship between tourism and interregional cooperation in the EU (Studzieniecki & Soares, 2017).

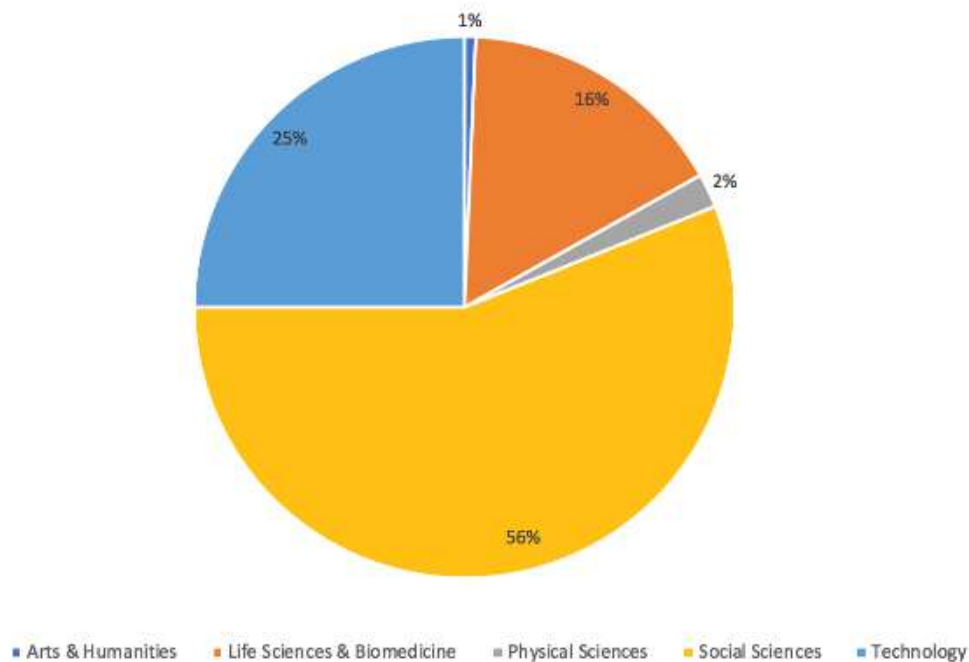


Figure 3.

Science Taxonomy for Worldwide Research Topics on Innovations in Sustainable Tourism.

As mentioned above that there might be overlapping research clusters as such that the scientific terms are relevant, in this case, for multiple taxonomies; it is evident from the network analysis that terms like industry or tool can be included in the scientific publications in the category of both social sciences and technology. Yaw (2005) examined the cleaner technologies to enhance the sustainability of the Caribbean tourism industry. While ITCs has been widely utilized within the context of innovations in

sustainable tourism (Del Vecchio, Mele, Ndou & Secundo, 2018; Guo, Meng, Zhang & Wang (2017); Tan & Law, 2016). Guo, Meng, Zhang & Wang (2017), in particular, introduce the concept of a smart city in their spatial development model of sustainable tourism towns. Buijtendijk, Blom, Vermeer & van der Duim (2018) investigate the role of technological and industrial eco-innovation in instigating transition towards sustainable tourism. They find that technological novelty is insufficient to instigate transition.

The spread of non-radical innovations in sustainable tourism

Table 1 below shows the examples of innovation in particular sectors in sustainable tourism. It does not articulate the tools or means of innovation, instead of the industry where the innovations take place. For example, this study demonstrates that one of the radical position innovations occurs in global tourism in the form of an ICT

platform for engaging sustainable approach (Tan & Law 2016). The presence of mobile learning for visitor management is perceived as a radical innovation in the area of knowledge management. The use of the mLearning elevates the position of sustainable tourism in the market by altering the perceptions and attitudes of customers toward sustainable tourism.

Table 1.
Evidence of innovations in sustainable tourism

	Radical Innovation	Non-radical Innovation
Process	General tourism (Del Vecchio, Mele, Ndou & Secundo 2018)	Eco-tourism (Wearing & Wearing, 1999; Gavrilovic & Maksimovic, 2018); social tourism (Martina, Buffa & Notaro, 2017); general tourism (Ribes & Baidal, 2018); transport tourism (Peeters, 2013; Scuttari, Della Lucia & Martini, 2013)
Production	Urban tourism (Jamhawi & Hajahjah, 2016; Gronau, 2017)	General tourism (Yaw, 2005; Liu & Cheng, 2018); heritage tourism (Lopez, Virto, Manzano & Garcia-Madariaga, 2018); coastal tourism (Vo, Pernetta & Paterson, 2013)
Position	General tourism (Tan & Law, 2016)	General tourism (Triantafyllidou & Tsiaras, 2018; Smolovic, Janketic, Jacimovic, Bucar & Stare, 2018)
Paradigm	Farm tourism (Lordkipanidze, Brezet & Backman, 2005); landscape tourism (Heute & Mantecon, 2017); exhibition for sustainable tourism (Koo, Chung & Nam, 2017; Guo, Meng, Zhang & Wang, 2017); cycle tourism (Gazzola, Pavione, Grechi & Ossola, 2018); general tourism (Coles, Dinan & Warren, 2016); heritage tourism (Sakdiyakorn & Sivarak, 2016)	Government initiative for sustainable tourism (Dabphet, Scott, & Ruhanen, 2012); eco-tourism (Escobar, Quishpe, & Escobar, 2017); community-based tourism (Matilainen, Suutari, Lahdesmaki & Koski, 2018); travel tourism (Buijtendijk, Blom, Vermeer & van der Duim, 2018); general tourism (Cooper, Ruhanen & Scott, 2015)

□

Despite the high entry barriers and market competitiveness, sustainable tourism shows more practices on non-radical innovations. This type of innovation involves improvements to the existing products services or the generation of the new or secondary characteristics. Scuttari, Della Lucia & Martini (2013), for example, introduce a tourism-traffic analysis based on survey technique to improve sustainable mobility planning in eight communities in Italy. The age of entrepreneurs, as a newly defined process characteristic, is argued to influence the promotion of sustainable tourism in Greece (Triantafillidou & Tsiaras, 2018).

Our literature review reveals that most innovations in sustainable tourism are not technology-specific. Smolovic, Janketic, Jacimovic, Bucar & Stare (2018), for example, attempt to understand the role of organizational, marketing, and design innovation in the transition toward more sustainable tourism in Montenegro. We, however, observe that technological innovations in sustainable tourism are in the form of ICTs (Del Vecchio, Mele, Ndou & Secundo, 2018; Gavrilovic & Maksimovic, 2018; Koo, Chung & Nam, 2017; Ribes & Baidal, 2018; Peeters, 2013); Jamhawi & Hajahjah, 2016) and resource-efficient technologies (Buijtdijk, Blom, Vermeer & van der Duim, 2018; Coles, Dinan & Warren, 2016; Cooper, Ruhanen & Scott, 2015). The use of technological innovations is distributed among the product life cycle from the paradigm to process phase.

In related to the region-specific study, this study finds that most case studies are in higher- and upper-middle-income countries, for example in Germany (Gronau, 2017), Taiwan (Liu & Cheng, 2018), Italy (Scuttari, Della Lucia & Martini, 2013); Spain (Heute & Mantecon, 2017); Sweden (Lordkipanidze, Brezet & Backman, 2005); Greece (Triantafillidou & Tsiaras, 2018); and Montenegro (Smolovic, Janketic, Jacimovic, Bucar & Stare, 2018). The topic of sustainability and environment have become the research interests in the higher income

countries as their economy has benefited much from industrialization and its externalities. A different school of thoughts, e.g. environmental and resource economics and ecological economics has emerged in an attempt to explain the views of the intertwined relationship between sustainability and environment (Ekins, Drummond & Watson, 2017). The case studies in heritage tourism in the lower-middle and lower-income countries, e.g. the case in Thailand (Sakdiyakorn & Sivarak, 2016) and Jordania (Jamhawi & Hajahjah, 2016), suggests that innovations, either non-technological or technological, drive the growth of sustainable tourism.

When discussing climate change, the case studies (Cooper, Ruhanen & Scott, 2015; Coles, Dinan & Warren, 2016; Buijtdijk, Blom, Vermeer & van der Duim, 2018) tend not to talk about the region-specific rather than a wider geo-perspective. It affirms the issue of climate change as a wicked problem with substantial social and economic impacts on global society (Ekins, Drummond & Watson, 2017). Public policies in eco-innovation, as suggested by Buijtdijk, Blom, Vermeer & van der Duim (2018), fortify the transitions to sustainable tourism in the light of mitigating climate change.

Reframing the business model of sustainable tourism

Paradigm innovations

Among the scientific literature that we examine, mostly innovation in sustainable tourism involves the change of business model. The footprint of the innovations in sustainable tourism varied from the conceptual framework to the practical how-tos in sustainable tourism. Heute & Mantecon (2017), for example, study the theoretical framework of innovative sustainable tourism projects using the concept of landscape in environments. Their qualitative research is primarily based on in-depth interviews with key stakeholders in the province of Alicante, Spain. In contrast to the conceptual framework; Gazzola, Pavione, Grechi & Ossola (2018) attempt to

understand the practical example of the change of the business model in the cycle tourism in Italy by using collaboration theory. A successful innovative family-based entrepreneurship in farm tourism named “Healthy Pig Farm” shows a new type of tourism model to answer the increased customer demand for natural and cultural characteristics (Lordkipanidze, Brezet & Backman, 2005).

The evidence of the technologies in paradigm innovations for sustainable tourism appears in the studies by Buijtendijk, Blom, Vermeer & van der Duim (2018); Coles, Dinan & Warren (2016); Cooper, Ruhanen & Scott (2015); and Koo, Chung & Nam (2017). While Koo, Chung & Nam (2017) investigate the use of ICTs in the exhibition of sustainable tourism, Buijtendijk, Blom, Vermeer & van der Duim (2018); Coles, Dinan & Warren (2016); and Cooper, Ruhanen & Scott (2015) examine the use of innovative resource-efficient technologies in sustainable tourism to reduce the carbon emission and mitigate climate change. Coles, Dinan & Warren (2016) argue that stimulating the energy literacy among small- and medium-sized tourism enterprises (SMTEs) is necessary to attract attention towards more energy-efficient generation.

Process and production innovations

Examples of process and product innovation are shown in Table 1. The list is not as exhausted as paradigm nor position innovations. Most researched subjects reveal the example of non-radical innovations for general tourism (Liu & Cheng, 2018; Smolovic, Janketic, Jacimovic, Bucar & Stare, 2018; Triantafillidou & Tsiaras, 2018; Yaw, 2005).

Position innovations

The current evidence can reject our earlier argument that views the tourism firms using innovations to position themselves in the market to be more competitive. Scholars find that innovations are utilized to change business models in sustainable tourism. It implies that regardless of how attractive the

services are for the customers, the way reframing the business is more important in sustainable tourism. This affirms the finding from Coles, Dinan & Warren (2016) that energy cost is not featured prominently in the business administration of SMTEs even though energy is a high cost of production. Tourism firms engage in changing the business models towards sustainable tourism without considering the economics. The finding is coherent to another study that suggests there is insufficient knowledge for tourism firms to reduce resources and induce innovations towards sustainability (Warren & Becken, 2017). Liu & Cheng (2018), however, suggest that innovations in Taiwanese micro- and small-enterprises are mostly driven by the lifestyle of the firm’s owners and customers - more to product innovations.

Challenges and business implications for sustainable tourism

The challenges in sustainable tourism appear when the business fails to show the perceptions and attitudes toward sustainability. Innovations, on the other hand, are understood to increase business and regional competitiveness and success for tourism firms (Gomezeli, 2016). Our study identifies that most innovations in sustainable tourism are non-radical as such that the knowledge spillovers on innovations from other industrial sectors are brought into the business without the need for the tourism firms to perform radical innovations that are supposed to be more costly than non-radical innovations. Hjalager (2010) concludes that small and medium tourism firms tend to be a free-rider and safe adopters for innovations in general. Among the product life cycle, innovations for business models are implemented mostly by tourism firms to demonstrate the notion of sustainability. It is easier to bring the perceptions and attitudes toward sustainability if the business model is altered, incorporating the notion into every product life cycle starting from process, production, to position.

While business model is important to set the fundamental assumption in offering the customer's value proposition, building the firm's competitive advantages, and envisioning the revenue streams; the fact that some tourism firms do not show perceptions and attitudes to incorporate both innovations and sustainability into the business (Warren & Becken, 2017; Coles, Dinan & Warren, 2016) raise a concern that the business strategy is not holistically defined and business risks are not properly addressed - rather for the sake of business transformation. Therefore, firm managers should utilize business analysis tools such as SWOT analysis, Porter's five forces analysis, or the extended Porter's six forces analysis before implementing the reframed business model.

The entangled interaction between firm's internal resources and external factors gives extra demand for the firms to fuel the innovations. In order to create innovations, firms require adequate internal resources from financing sources to human capital. Firm managers, however, should pay more attention to the quality of the resources such as tactical strategies for innovation, supportive organization structure, or employee's mindset; than merely the resources themselves (Das, Verburg, Vebraeck & Bonebakker, 2018; Le, Hollenhorst, Harris, McLaughlin, & Shook, 2006). On the other hand, external factors such as public policies, government supports, or environmental characteristics are identified to be important for the context of developing the sustainable tourism (He, He, & Xu, 2018; Le, Hollenhorst, Harris, McLaughlin, & Shook, 2006). In the absence of supportive external factors that are uncontrollable by the firms, managers should focus on developing high-quality internal resources.

Based on our findings, most non-radical innovations in sustainable tourism are non-technological specifics. It involves the change of business process in every step of the product life cycle, for example the marketing activities in the case of Montenegrin tourism industry (Smolovic, Janketic, Jacimovic, Bucar & Stare, 2018). Also, introducing ITCs into

the business to spark innovations should take into account how the change can affect the whole business process. To deal with such transformation, a procedure of change management should be in place to safeguard the business goals during the transition. Firms can implement any change management model, for example, the ADKAR (Awareness, Desire, Knowledge, Ability, Reinforce), the Lewin's three stages, or the Kotter's 8-step (Tang, 2019), in accordance to the purpose and magnitude of the business change.

5. Conclusion

This study's theoretical contribution stems from the type of innovation applied to address the challenge in maintaining sustainability in the tourism industry as highlighted by existing studies. This paper reveals two distinctive significant research clusters that discuss the theoretical and practices of innovations in sustainable tourism. It is found that studies in basic science dominate the scientific literature; followed by applied science that discusses the implementation of innovation in sustainable tourism. It implies that the interests of the researches are mostly to understand how innovations can be implemented in sustainable tourism. This can also be seen from the limited examples of technological innovations in sustainable tourism. We observe that technological innovations in form of the ICTs and resource-efficient technologies dominate the sustainable tourism.

Categorizing the innovation-related terms based on the two-dimensional model of innovation theory (Bessant & Tidd, 2007; Rowley, Baregheh & Sambrook, 2011), this study indicates that the majority of sustainable tourism firms implement non-radical innovation to enter the tourism market. More specifically, non-radical paradigm innovation is dominating the literature in sustainable tourism innovation; whereby the plethora of studies suggests that innovations in sustainable tourism mostly use

non-technological means or tools to innovate. ICTs are used mainly in the context of tourism sustainability, whereas resource-efficient technologies are mostly discussed for the use of innovations in sustainable tourism in the light to combat climate change.

Accordingly, as for practical implications, this study suggests that reframing the business models is essential for tourism firms to implement. The change of organizational, marketing, and design innovation is recommended to transform the current tourism to more sustainable tourism (Smolovic et al., 2018). For example, while marketing is the core function of Destination Marketing Organizations (DMOs), restructuring its business model using multidimensional constructs, e.g. the combination of marketing and stakeholder management (e.g. leadership, coordination across stakeholders) is an essential facet to sustain destination competitiveness (Line & Runyan, 2014).

We recognize that this study has several methodological limitations. Employing limited bibliometric data from 91 scientific publications from Web of Science (WoS), we argue that despite the broad discussion in the literature, the notion of how innovation is implemented in the sustainable tourism concept is somewhat difficult to specify due to the overlapping research clusters as well as the limited occurrence of innovation-related terms. The subjectivity of the scholars limits the interpretation of the network analysis map. One term can be interpreted differently. There is a restriction on the search query used to extract the bibliometric data as such that it might not capture the specific innovation topics in sustainable tourism. This study also does not segregate the scientific between scientific articles published in high and low impact journals. Further study can focus only on high impact journals based on WoS metrics.

This research offers provocative ideas for future studies. We recommend taking a look

in detail for the motivation of the innovation in sustainable tourism to complement the current theoretical understanding. Our preliminary result shows a disconnected discourse of innovation economics in the economy of sustainable tourism. Empirical studies to examine the relationship between innovations and more specific sectoral tourisms (i.e. transport tourism or coastal tourism) can shed light on a fine-grained comprehension on the mechanism of innovations both in a theoretical and practical context. We do not find any evidence of how the firms exercised business analysis tools to implement and address innovations in sustainable tourism. Therefore, it is interesting to understand how the firms operate the reframed business model in the light of sustainability in the future studies.

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